



Servers Optimized for Highest Performance and Performance-per-Watt

Introducing New SuperServers Equipped with Latest Generation Intel® Xeon® Processor E5-2600 v4 Product Family

Industry's Broadest Family of Green Server Systems

Supermicro introduces the IT industry's broadest portfolio of new generation servers, demonstrating the highest performance, energy efficiency, and cost effectiveness. The performance and efficiency gains of three Supermicro SuperServer® systems were measured with the latest generation Intel® Xeon® E5-2650 v4 "Broadwell" CPUs versus previous generation E5-2650 v3 "Haswell" CPUs. The servers tested included representative 1U, 2U, and 4U systems. System performance was measured with the High Performance LINPACK (HPL) benchmark and system Power Efficiency was measured using power meter wattage*.

1U Data Center Optimized (DCO) System

The new 1U SuperServer® SYS-6018R-MDR DCO system supports up to 1TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 8 DIMM slots, 1 PCI-E 3.0 x8 (FHHL) slot, 2 fixed 2.5" SATA 3.0 (6Gbps) drive bays, dual GbE LAN port, and IPMI 2.0 + KVM with dedicated LAN, and the latest Intel® Xeon® E5-2600 v4 processor product family.

With an innovative thermal architecture that utilizes power efficient components, offset processors to help eliminate CPU preheating, and highest-efficiency power supplies to support higher operating temperatures, DCO systems deliver the best performance-per-watt to complement modern energy efficient data center designs.

The E5 v4 based DCO system (Figure 1) delivered 27% better performance and 27% better performance-per-watt than the E5 v3 based DCO system, as shown Table 1.



Figure 1: Supermicro DCO (SYS-6018R-MDR)

Test	SYS-6018R-MDR CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	814.3	642.4	27%
Power (Watts)	307.7	309.0	
Performance per Watt	2.65	2.08	27%

Table 1: DCO Benchmark Results

2U TwinPro^{2™} System

The new generation Supermicro 2U TwinPro^{2™} SYS-2028TP-HTR with 4 DP nodes in 2U provides, per node, up to: 2TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 16 DIMM slots; PCI-E 3.0 x16 for add-on card solutions such as PCI-E SSD, dual 10GbE with SFP+, 10GBase-T, InfiniBand, or Gigabit Ethernet/100GbE networking options; and 6 SAS3 (12Gbps) 2.5" hot-swap HDD/SSDs per node; IPMI 2.0 + KVM with dedicated LAN; SuperDOM; and TPM header. The 2U TwinPro^{2™} supports redundant 2000W Titanium Level (96%+) Digital power supplies and each node supports the latest Intel® Xeon® processor E5-2600 v4 product family.

The 2U TwinPro^{2™} architecture builds on Supermicro's proven Twin technology to provide the highest throughput storage, networking, I/O, memory, and processing capabilities in 2U. This allows customers to further optimize Supermicro solutions to solve their most challenging IT requirements.

The E5 v4 based 2U TwinPro^{2™} system shown in Figure 2 demonstrated a 26% improvement in performance over the identical system configured with previous generation E5 v3 CPUs and memory. Performance-per-watt was also significantly higher at 29% with the new generation system. These data are shown in Table 2.



Figure 2: Supermicro TwinPro^{2™} (SYS-2028TP-HTR)

Test	SYS-2028TP-HTR CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	818.2	647.3	26%
Power (Watts)	329.9	336.5	
Performance per Watt	2.48	1.92	29%

Table 2: 2U TwinPro^{2™} Benchmark Results

4U FatTwin™ Front I/O System

The Supermicro FatTwin™ SYS-F618R3-FTL is a 4U, 8 hot-plug node system that supports, per-node, up to 1TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 8 DIMM slots, 1 PCI-E 3.0 x16 LP slot, 4 ports of SATA 3.0 (6Gbps) with Intel® C612 controller, dual Gigabit Ethernet ports, integrated IPMI 2.0 with KVM over dedicated LAN, and dual new generation Intel® Xeon® processor E5-2600 v4 / v3 product families up to 22 cores and 145W TDP per socket. The FatTwin™ supports redundant 2000W Titanium Level (96%+) Digital power supplies and dual large-diameter dual 17cm rear cooling fans for highest efficiency.

The Supermicro FatTwin™ represents a revolution in Green Computing designed to support customers' critical applications and also reduce Data Center TCO to help preserve the environment. The FatTwin™ extends the compute and storage capabilities of Supermicro's existing Twin SuperServer® systems to achieve increased performance and power efficiency. Due to its shared components the FatTwin™ improves cost-effectiveness and reliability, while its modular architecture makes it flexible to configure and easy to maintain.

The E5 v4 based FatTwin™ system demonstrated a 26% improvement in performance over the previous generation E5 v3 based system. Performance-per-watt improvement with the E5 v4 based system was 25%. These data are shown in Table 3.



Figure 3: Supermicro FatTwin™ (SYS-F618R3-FTL)

CPU Generation	SYS-F618R3-FTL CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	832.5	659.9	26%
Power (Watts)	313.5	309.9	
Performance per Watt	2.66	2.13	25%

Table 3: FatTwin™ Benchmark Results

Results

Performance

Improvements in Performance for three new generation E5 v4 based 1U/2U/4U Supermicro SuperServer® systems were measured over previous generation E5 v3 based

systems using the HPL benchmark test. The Performance results for the three systems tested were nearly identical as shown in Chart 1, and the Performance increases between new generation systems and previous generation systems were also similar at 26% to 27%.

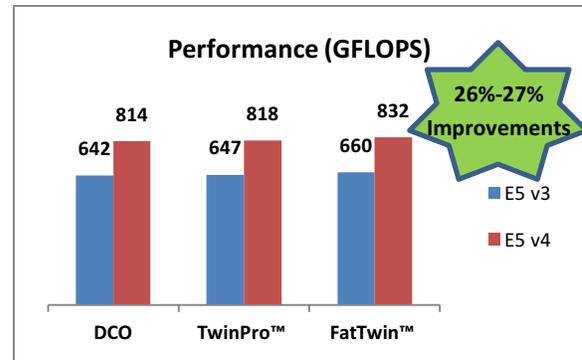


Chart 1: Performance Improvements for 3 Systems

Performance-per-Watt

The improvements in Performance-per-Watt between the new generation E5 v4 based systems and previous generation E5 v3 based systems were nearly identical for all the models tested, varying between 25% and 29%.

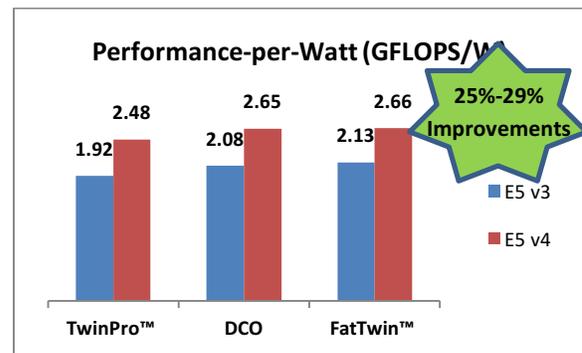


Chart 2: Performance/Watt of 3 SuperServer® systems

Conclusions

Improvements in Performance and Performance-per-Watt were measured between Supermicro new generation (E5 v4 "Broadwell") and previous generation (E5 v3 "Haswell") based SuperServers, in three different form factors (1U/2U/4U). Performance and Performance-per-Watt increases were found to be nearly identical, varying in a small range between 25% and 29%. Since the two processor generations (E5 v4 and E5 v3) are comparably priced, these reported improvements offer compelling economic incentives for customers to select Supermicro servers for new deployments or to refresh their current legacy server infrastructures.

* Test environments and configurations were identical; memory speed used with the E5 v4 CPUs was 2400MHz and for the E5 v3 CPUs was 2133MHz. Results are based on internal testing. Performance tests were measured using specific server systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. For more information please contact your Supermicro sales representative or visit: www.supermicro.com